

### Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

49. (Currently Amended) ~~At least one population~~ One or more populations of scattered light-detectable particles, each said population comprising a plurality of specifically detectable metal like light scattering particles, wherein said particles comprise at least one metal like light scattering material said particles comprising gold and having a size between 1 and 500 nm inclusive, wherein when each said population is on a surface at a particle density of less than 0.1 particles per  $\mu\text{m}^2$  and illuminated by white light, the color of scattered light scattered by at least 90% of said particles of each said population is indistinguishable to the human eye when viewed with less than 500 times magnification and without electronic amplification, and wherein said particles ~~have at~~ comprise at least one additional material on their surfaces ~~that provides and specific binding to an analyte.~~

50. (Currently Amended) The ~~population~~ populations of claim 49, wherein said at least one additional material does not significantly interact with light in the visible region of the spectrum.

51. (Currently Amended) The ~~population~~ populations of claim 50, wherein for one or more of said populations said at least one additional material comprises a protein, a nucleic acid, a peptide or peptide or a carbohydrate.

52. (Currently Amended) The ~~population~~ populations of claim 50, wherein for one or more of said populations said at least one additional material comprises a polymer.

Claims 53-54. (Cancelled).

55. (Currently Amended) The ~~population~~ populations of claim 49, wherein said particles are spherical, oval or ellipsoidal.

Claims 56-59. (Cancelled).

60. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations the coefficient of variation in size of said ~~plurality of~~ particles ~~in a said population~~ is less than 5%.

61. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles further comprise a surface coat of gold.

62. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles further comprise a surface coat of silver or silver alloy.

63. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles further comprise a metal, a metal compound, a metal oxide, a semiconductor or a superconductor.

Claims 64-65. (Cancelled).

66. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles further comprise ~~gold and another~~ a metal-like material.

Claim 67. (Canceled)

68. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles further comprise ~~gold and~~ a non-metal-like material.

Claims 69-70. (Canceled)

71. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles further comprise ~~gold and~~ a magnetic or ~~ferro electric~~ ferroelectric material.

72. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles ~~are composed of~~ further comprise a mixture of metal-like materials and a magnetic or ~~ferro electric~~ ferroelectric material.

73. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles ~~are composed of~~ further comprise silver and gold and a magnetic or ~~ferro-electric~~ ferroelectric material.

Claims 74-75. (Cancelled).

76. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles ~~comprise gold and have an average diameter~~ are of a size between 10 and 45 nanometers, between 50 and 70 nanometers or between 80 and 120 nanometers, inclusive.

Claims 77-79. (Cancelled).

80. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles further comprise silver and ~~have an average diameter~~ are of a size between 5 and 50 nanometers, between 50 and 70 nanometers or between 80 and 120 nanometers.

Claims 81-83. (Cancelled).

84. (Currently Amended) The ~~population~~ populations of claim 49, wherein for one or more of said populations said particles further comprise silver and ~~have a diameter~~ are of a size ~~selected from the group consisting of~~ about 10, about 15, about 20, about 30, about 40, about 60, and ~~about 80, about 100 and about 150 nm.~~

Claims 85-87. (Cancelled).

88. (Currently Amended) The ~~two or more~~ populations of ~~claim 85~~ claim 49, wherein for one or more of said populations ~~have a size distributions with~~ the coefficient ~~coefficients~~ of variation in size of said particles is less than 5%.

Claims 89-165. (Cancelled).

166. (New) The populations of claim 49, wherein for one or more of said populations said at least one additional material comprises a binding agent capable of binding specifically to a predetermined analyte.

167. (New) The populations of claim 166, wherein the color of the scattered light scattered by two or more of said populations is distinguishably different, and wherein said binding agent of each said two or more populations is capable of binding different predetermined analytes.

168. (New) The populations of claim 166, wherein for one or more of said populations said binding agent comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

169. (New) The populations of claim 49, wherein for one or more of said populations said at least one additional material comprises a plurality of base molecules.

170. (New) The populations of claim 49, wherein for one or more of said populations said at least one additional material comprises a plurality of different base molecules.

171. (New) The populations of claim 168 or 169, wherein for one or more of said populations said base molecules comprise a gelatin, a polyethylene glycol, a carbohydrate, a polyamino acid or a protein.

172. (New) The populations of claim 168, wherein for one or more of said populations said at least one additional material further comprises a binding agent that is bound to said base molecules, and wherein said binding agent is capable of binding specifically to a predetermined analyte.

173. (New) The populations of claim 49, wherein for one or more of said populations said particles are of a size of about 10, about 16, about 20, about 30, about 40, about 50, about 60, about 70, about 80, about 100, about 120, about 140, about 150, about 160, about 200 or about 300 nm.

174. (New) The populations of claim 62, wherein for one or more of said populations said surface coat is about 0.5, about 0.8, about 1, about 3, about 4, about 5, about 9, about 19, about 39, about 49 or about 74 nm thick.

175. (New) The populations of claim 61, wherein for one or more of said populations said surface coat is about 0.5, about 1.5, about 2, about 4, about 5, about 6, about 10, about 12 nm or about 20 nm thick.

176. (New) The populations of claim 49, wherein for one or more of said populations said particles are of a size of about 60 nm, about 100 nm or about 120 nm, and wherein said additional material comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

177. (New) The populations of claim 49, wherein for one or more of said populations said particles are of a size of about 80 nm, and wherein said additional material comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

178. (New) The populations of claim 62, wherein for one or more of said populations said particles are of a size of about 40 nm, about 80 nm or about 100 nm, and wherein said additional material comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

179. (New) The populations of claim 62, wherein for one or more of said populations said particles are of a size of about 60 nm, and wherein said additional material comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

180. (New) The populations of claim 49, wherein for one or more of said populations said particles are of a size of about 80 nm, wherein said additional material comprises antibiotin antibodies, antidigoxinin antibodies or antifluorescein antibodies.

181. (New) The populations of claim 62, wherein for one or more of said populations said particles are of a size of about 60 nm, wherein said additional material comprises antibiotin antibodies, antidigoxinin antibodies or antifluorescein antibodies.

182. (New) One or more populations of scattered light-detectable particles, said particles comprising gold and having a size between 1 and 500 nm inclusive, wherein the

distribution of sizes in said population is characterized by a coefficient of variation of less than 5%, and wherein said particles comprise least one additional material on their surfaces.

183. (New) The populations of claim 182, wherein for one or more of said populations the mean size of said population of particles is about 20nm, about 40 nm, about 60nm, about 80nm, 100 nm or 120 nm.

184. (New) The populations of claim 182, wherein for one or more of said populations said at least one additional material comprises a binding agent capable of binding specifically to a predetermined analyte.

185. (New) The populations of claim 184, wherein the color of the scattered light scattered by two or more of said populations is distinguishably different, and wherein said binding agent of each said two or more populations is capable of binding different predetermined analytes

186. (New) The populations of claim 184, wherein for one or more of said populations said binding agent comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

187. (New) The populations of claim 182, wherein for one or more of said populations said at least one additional material comprises a plurality of base molecules.

188. (New) The populations of claim 182, wherein for one or more of said populations said at least one additional material comprises a plurality of different base molecules.

189. (New) The populations of claim 187 or 188, wherein for one or more of said populations said base molecules comprise a gelatin, a polyethylene glycol, a carbohydrate, a polyamino acid or a protein.

190. (New) The populations of claim 187, wherein for one or more of said populations said at least one additional material further comprises a binding agent that is bound to said base molecules, wherein said binding agent is capable of binding specifically to a predetermined analyte.

191. (New) The populations of claim 182, wherein for one or more of said populations said particles are of about 10, about 16, about 20, about 30, about 40, about 50, about 60, about 70, about 80, about 100, about 120, about 140, about 150, about 160, about 200 or about 300 nm.

192. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise a surface coat of gold.

193. (New) The populations of claim 192, wherein for one or more of said populations said surface coat is about 0.5, about 1.5, about 2, about 4, about 5, about 6, about 10, about 12 nm or about 20 nm thick.

194. (New) The populations of claim 182, wherein for one or more of said populations said particles are of a size of about 60 nm, about 100 nm or about 120 nm, and wherein said additional material comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

195. (New) The populations of claim 182, wherein for one or more of said populations said particles are of a size of about 80 nm, and wherein said additional material comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

196. (New) The populations of claim 182, wherein for one or more of said populations said at least one additional material does not significantly interact with light in the visible region of the spectrum.

197. (New) The populations of claim 196, wherein for one or more of said populations said at least one additional material comprises a protein, a nucleic acid, a peptide or a carbohydrate.

198. (New) The populations of claim 196, wherein for one or more of said populations said at least one additional material comprises a polymer.

199. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise a surface coat of silver or silver alloy.

200. (New) The populations of claim 199, wherein for one or more of said populations said surface coat is about 0.5, about 0.8, about 1, about 3, about 4, about 5, about 9, about 19, about 39, about 49 or about 74 nm thick.

201. (New) The populations of claim 199, wherein for one or more of said populations said particles are of a size of about 40 nm, about 80 nm, or about 100 nm, and wherein said additional material comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

202. (New) The populations of claim 199, wherein for one or more of said populations said particles are of a size of about 60 nm, and wherein said additional material comprises biotin, avidin, streptavidin, a nucleic acid, a protein, a peptide, an antibody, an antigenic substance, a receptor, a hormone, digoxinin, fluorescein or a pharmaceutical agent.

203. (New) The populations of claim 199, wherein for one or more of said populations said particles are of a size of about 60 nm, wherein said additional material comprises antibiotin antibodies, antidigoxinin antibodies or antifluorescein antibodies.

204. (New) The populations of claim 182, wherein for one or more of said populations said particles are of a size of about 80 nm, wherein said additional material comprises antibiotin antibodies, antidigoxinin antibodies or antifluorescein antibodies.

205. (New) The populations of claim 182, wherein for one or more of said populations said particles are spherical, oval or ellipsoidal.

206. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise a metal, a metal compound, a metal oxide, a semiconductor or a superconductor.

207. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise a metal-like material.

208. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise a non-metal-like material.



209. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise a magnetic or ferroelectric material.

210. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise a mixture of metal-like materials and a magnetic or ferroelectric material.

211. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise silver and a magnetic or ferroelectric material.

212. (New) The populations of claim 182, wherein for one or more of said populations said particles are of a size between 10 and 45 nanometers, between 50 and 70 nanometers or between 80 and 120 nanometers.

213. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise silver and are of a size between 5 and 50 nanometers, between 50 and 70 nanometers or between 80 and 120 nanometers.

214. (New) The populations of claim 182, wherein for one or more of said populations said particles further comprise silver and are of a size of about 10, about 15, about 20, about 30, about 40, about 60, about 80, about 100 or about 150 nm.

215. (New) The populations of claim 49 or 182, wherein for one or more of said populations at least one said additional material provides chemical stability.

216. (New) The populations of claim 49 or 182, wherein for one or more of said populations, said populations comprise at least about  $10^5$ , about  $10^6$ , about  $10^7$ , about  $10^8$ , about  $10^{10}$ , about  $10^{11}$ , about  $10^{12}$  or about  $10^{13}$  particles.